NIH NATIONAL CANCER INSTITUTE

MULTIFUNCTIONAL RNA NANOPARTICLES AS THERAPEUTIC AGENTS

SUMMARY

The National Cancer Institute is seeking statements of capability or interest from parties interested licensing or in collaborative research to co-develop RNAi-based nanoparticle therapeutics for cancer and HIV.

REFERENCE NUMBER

E-765-2013

PRODUCT TYPE

- Therapeutics

KEYWORDS

- RNAi
- nanotechnology
- siRNA
- nanoparticle, breast cancer

COLLABORATION OPPORTUNITY

This invention is available for licensing and co-development.

CONTACT

John D. Hewes
NCI - National Cancer Institute
240-276-5515

John.Hewes@nih.gov

DESCRIPTION OF TECHNOLOGY

The promise of RNA interference based therapeutics is made evident by the recent surge of biotechnological drug companies that pursue such therapies and their progression into human clinical trials. The present invention discloses novel RNA and RNA/DNA nanoparticles including multiple siRNAs, RNA aptamers, fluorescent dyes, and proteins. These RNA nanoparticles are useful for various nanotechnological applications. This technology has a higher detection sensitivity and higher silencing efficiencies of targeted genes than conventional siRNAs. This technology has significant therapeutic potential against multiple disease types, including, cancer and viral infections. A breast cancer xenograft mouse model indicated uptake of the nanoparticles, and six different HIV targets were validated with cell cultures.

POTENTIAL COMMERCIAL APPLICATIONS

• Treatment for cancer and HIV

COMPETITIVE ADVANTAGES

- Potential for higher sensitivity, higher efficiency, low cytotoxicity, multiple functionality, multiple targets, and controlled activation

INVENTOR(S)

Bruce A. Shapiro (NCI), Kirill A. Afonin (NCI), Angelica N. Martins (NCI), Mathias D. Viard (NCI)

DEVELOPMENT STAGE

- Discovery (Lead Identification)

PATENT STATUS

- **U.S. Filed:** US National Stage application # 15/022,530 (16 March 2016)
- **Foreign Filed:** Applications filed in Japan, Europe, Australia, Canada, and China

RELATED TECHNOLOGIES

- E-039-2012 - Targeted Nanoparticles for the Treatment of Virus-infected or Cancerous Cells
- E-156-2014 - Nucleic Acid Nanoparticles for Triggering RNA Interference

THERAPEUTIC AREA

- Cancer/Neoplasm
- Infectious Diseases